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"The Watch."

(THIRD EDITION.)

HAND WORK VERSUS MACHINERY,

THEIR MERITS AND DEFECTS EXPLAINED AND COMPARED. HISTORY OF WATCH MAKING BY BOTH SYSTEMS.

— BY —

Published by the Author at 36 Maiden Lane, where this book can be obtained singly or by the quantity.

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1877

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THEIR MERITS AND DEFECTS EXPLAINED AND COMPARED. HISTORY OF WATCH MAKING BY BOTH SYSTEMS.

—BY—

HENRY F. PIAGET,

OF OVER SIXTY YEARS PRACTICAL EXPERIENCE IN WATCH MAKING AND REPAIRING.

No. 36 MAIDEN LANE,

NEW YORK,

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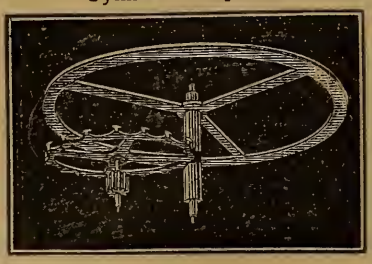
Cylinder Escapement.



Patent or Detached Lever Escapement

Quarter Second Stem Winder.

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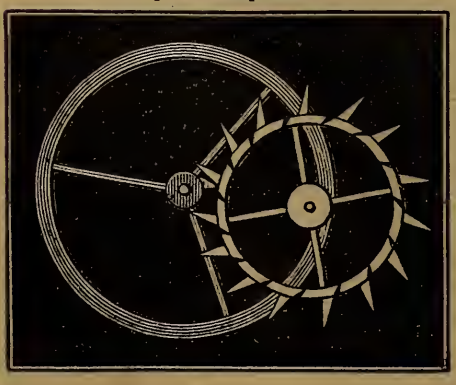
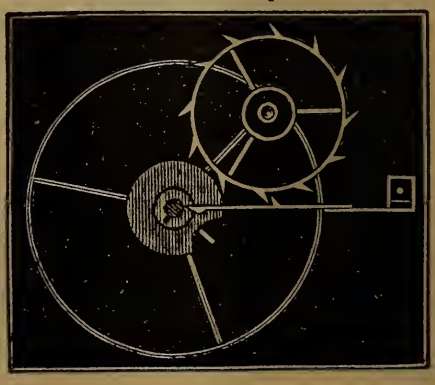
Duplex Escapement.



Chronometer Escapement.



WATCH-MAKING,

BY HAND WORK AND BY MACHINERY,

EXPLAINED AND COMPARED.

To the American Public:—

It was my intention not to have written or published anything again on the subject of Watches, after issuing the last edition of "The Watch" in 1868. But I find now that I have to do it, and that it is my duty as a native of Switzerland; for a Swiss never forgets his native land, however long he may have been away, or how far he may be from it; and also as an American citizen and the birthplace of my children. I do it also for the purpose of endeavoring to assuage the feelings of rivalry which now exist between the Swiss and American Watch Manufacturers; which rivalry, if it continues, will end in disastrous consequences to the working classes of both nations. I will again state in an impartial and plain manner, "What I know about Watches," acquired by the practical experience of 60 years.

These feelings of rivalry and competition have been brought about by events hereafter explained, and lately by Mr. Favre Perret's speech before the Council of Commerce in Locle, last November. I am not doing this because I am personally acquainted with him, as I have never seen or spoken to him, but he not being here to defend himself, and as, like him, I wish to be impartial, and as I have always tried to be truthful in my statements, I will discuss with the public both sides of the question, then let them and time decide who is right or wrong.

I will have to repeat in order to be better understood, some parts of his speech, which, although published in many journals and newspapers; in some it was not done correctly, but only reported in such a manner, that would suit certain parties. I must observe that I really think, that more was said to the Swiss than was really necessary, as it had, I am afraid, the effect to dishearten

many of them, but let them like their forefathers, "buckle on their armor," and they will yet find that "right will conquer might."

As to the statement made that "we would not find one such watch among fifty thousand of our manufacture," I consider perfectly absurd and even ridiculous, and must have been said by a person who could not have had much experience in American Watches. He certainly must have been prejudiced or he must have alluded to the cheap or *camelotte* kind of Swiss ones, and not to the kind called *bon courant* or medium grade, made in Locle, Chauz de Fonds, Neuchatel or Geneva, which are fully equal to the fifth grade of the American which he examined, and I will even say better, for I maintain that a Swiss movement costing at the factory 75 francs or 16 dollars, finished by hand work, particularly if smaller, flatter or thinner than the usual American 18 size, will be better finished, keep more accurate time, and last good, longer, than one made entirely by machinery for the same price. My reasons will be explained as I proceed with my explanations of the different systems of manufacturing, although I must acknowledge that the Swiss have not been careful enough to have their Watches properly regulated before they were sent away, particularly the cheap kind.

He said "it is evident that the great question is to know whether the Americans are able to supply their own market, 'if so' we shall be expelled from the American market, but I expect even then, carefully finished Watches, in which branch we still are, and I hope will still remain their masters." The American journals have suppressed the word 'if' and replaced the words 'carefully finished' or soignés by that of complicated. This makes me say: 'yes, we shall be expelled from the American market.' This clearly changes the meaning and importance of my words. I understand to the fullest extent, the powerful opposition which the Americans know so well how to make, but I will not permit the sense of what I have said to be perverted by such artifice, or unworthy means employed to spread falsehoods under cover of my name and official position, as member of the jury of exhibition at Philadelphia."

Since then he has been accused of having turned a "somersault" and of having "turned himself inside out." Now, like him, I have been blamed and slandered for having told the truth and giving good advice in my former editions. I know exactly what his feelings must be, particularly when his meaning, which I believe was honest was so perverted and misunderstood.

When I impartially explained facts about the "merits and defects" in different kinds of watches, I was ridiculed, abused, and stigmatized as a "boaster," that I told too much. This I will admit, as I exposed many evils, that I was too partial, had too many "old fogy notions, &c. When I mentioned to some that I intended to issue a third edition of my work, they said that it was useless, that this was a "progressive age," and could not be applied to watches made on the old principle of hand work. My object is now to show how beneficial or otherwise this "progression" has been to the working classes, and also to compare both systems of hand and machinery made watches, as well as endeavor to explain the relative "merits and defects," as I did many years ago, of those made previous to that.

I would respectfully request of anyone having this pamphlet, that they will take the trouble to read it thoroughly through, not skip from one part to another, as perhaps by doing so they might miss some words, as "if," "finely finished," or "complicated," or others, whereby my meaning and purport would be changed.

I shall for fear of being also accused of turning a "somersault" be compelled to refer to several parts of the former editions of "The Watch," as well as to the history of watch making in Europe and America, when I gave the names of the best and most reliable makers of England, France, Switzerland and America, with my opinions of them all.

I would also say to those who have made the observation that I was "too old" to know much about the way of manufacturing now, that, thank Heaven, my intellect, my hearing, and my sight are but slightly impaired yet, those three very essential faculties in watch work, nor have I forgotten what I learned about it, and, although I should find it difficult to do now by hand what I have formerly done, I assure them that I can do much of it yet, and if I have it done I can judge if it is done in a proper manner.

I did not learn my trade by the present style of making watch makers, which is often only by theory, but by the old, although slow process, together with long practical experience, but which I maintain till this "fast age," was the best.

The question now is not exactly as it used to be who can make the best and most durable watch, but who can make the cheapest and the greatest quantity, not for the benefit of the workman, but in many cases for the profit of speculators and the enriching of the "drones in the hives"

I do not pretend to be a scientific writer on horology, a Reed, Berthoud, Earnshaw, Grossman, &c., have been, or as some good

ones are now, while there are some who write on this subject now, who know as much about it as I do about locomotives.

They often use many, as they think learned and technical words about the different parts, that it often puzzles practical workmen to understand their meaning. For my part I try to explain myself in as plain a manner as possible so that all the public, as well as watch makers, can understand what I mean, that is "if" they will acknowledge it.

I do pretend that I was the first to publish an essay on watches in this country, which was afterwards copied with my permission, as it was copyrighted, in the *Scientific American*, which they certainly would not have done if useless and not worthy.

I was also the first that obtained Prizes for my own work. After I published my first book it was followed by publications and papers on the same subject, the appearance and engravings of which are certainly better and more showy than mine, but they were principally for the purpose of advertisements for the Watch and Jewelry trade.

There is certainly some very excellent articles in some of them and very useful to many in both trades. But there are some that think that by only reading them they can become manufacturing jewellers or repairers of watches without the aid of any other teachers. If they can, I wish them success, but I am afraid that in many instances they will only make more work for the more experienced workmen.

My work was only to inform the public what a delicate piece of machinery a watch was, what care was required to keep it in good order ; what I knew about the different kinds, of all countries ; the opinions, suggestions and advices given were mine and for the use of all wearers of watches as well as for watch makers.

It could not be correct, because it did not agree with the ideas of some of making money without work, and I was derided and scoffed at. I say this because several attempted to injure my little business prospects. But, thank Providence, although it was done to some extent, I am here yet and will endeavor to help with my pen, the working classes of Switzerland in their struggle against capital, bombast and many false representations, particularly after they had toiled for so many years, to improve themselves, and had nearly obtained perfection in fine and carefully finished as well as in complicated watches.

It must be understood that a complicated watch must necessarily be carefully finished, to be good. There are many compli-

cated ones that are not good, their complication only serving to make them bad, particularly if they are put in unskilled workmen's hands to clean or repair.

The English have nearly obtained perfection for their Chronometers and Duplex escapements, but do not make so many as of the Levers, on account of the difficulty of having them properly repaired in case of accidents, neither are they so well adapted for the pocket.

Wishing to explain the different systems, "if" I say anything to offend either party, I beforehand apologize, but I always have been and I am still a workingman and as such wish to protect with all in my power the interest of my fellow craftsmen. Some may deride me and say that I can do nothing, or do any good, but I have always found that "one story is good till another is told," at the same time giving "honor where honor is due," and as Pope said :

> "'Tis with our judgments as our watches, none
> Go just alike, but each believes his own,"

which although said a century ago is appropriate to the present time.

I certainly agree with what was said that the Swiss had placed too much confidence in their way of manufacturing by the old system, and that the Americans have excelled them in their adoption of machinery of all kinds for lessening the labor and lowering the prices of watches. But I do not yet admit that they have equalled or surpassed the Swiss in the quality for the same price, particularly when the heavy duty on their importation is considered, and made by good and skilful workmen such as are to be found in Geneva, Locle, Val du Joux, &c, particularly for fine carefully finished and complicated as well as small and thin watches. It may be yet accomplished here, but the day is far distant. The fashion also may change although not to such an extent or so often as clothing, jewelery, &c. I well remember the time when in Europe it was the fashion for all that could afford it, to carry a repeating watch. That was the reason that I first learned to make the repeating part of them The musical and repeating watches were also made in Switzerland at that time. They would play a distinct tune with 24 springs, would play an air every hour if wanted, or could be made to play at any time. All this required three distinct set of wheels and 3 springs, one for the watch part which was usually with a cylinder escapement, one for the repeating part and one for the musical part. There is some to be found occasionally, but they have not been made for years. Seals to wear

with the chains from the fob were also made with music, but they soon went out of date as only 10 or 12 springs could be applied for the air and could not be very correct. The most complicated watch that I worked at when apprenticed in London was one with a duplex escapement made for Arnold. It consisted of a clock arrangement that struck every quarter of an hour, similar to the clock on Trinity Church, New York, with the exception of its only striking two blows instead of four for the quarters. It repeated the hours and quarters and half quarters at pleasure, and had also an alarm which could be set to any time, the striking was all done on five different spiral springs. Thus, with the watch part it had four distinct sets of wheels and springs in barrels. Although the size did not exceed that of an ordinary English watch, the cost of it was four hundred guineas, two thousand dollars. But few such watches were ever made, neither ought they to be, as like the very small and complicated ones that were made many years back, a lunatic asylum would have to be erected for crazy watch makers, who worked long at them. About the year 1830 the fashion changed, and I then had to learn other branches of watch work, such as escapement making, or finishing, &c.

But the fashions will always change somewhat in every business, and persons do sometimes get tired of wearing the same watch, unless he has a very good one, which he will be very reluctant to part with, unless it has been spoiled in repairing, often past redemption, as it is often the case after going through the hands of some of the so called watch makers, which in this country is a very common occurrence.

If the Swiss would only follow the advice given to them, they should establish schools for watch-makers and repairers, where every branch can be taught. Simplify, improve and perfect as well as make new machinery as the Americans have done, which seeing the danger they are in, they will certainly do. Let them remember that the French Exposition of 1878 may also tell a different tale than that of Philadelphia. I have no doubt that they will regain whatever they may have lost, and by exertion and care, Switzerland may yet prove herself the model nation for watches, as they have been for republics throughout the world.

It may seem presumptious in me to say so, but I must give my opinion, which I do without any intention to disparage or injure any manufactories if carried on in an honorable way, and with justice to the workingmen. I wish there was enough demand for more of them, for the sake of workmen or laboring classes.

But I believe with my long experience on every kind of

English, French, Swiss and American watches, I ought to be well posted by this time, about the quality, durability, accuracy and finish of all, which I explained before ; and now since there has been a change in manufacturing will try to do again. I wish to show that both systems have merits as well as faults, also what will be the result from overstocking the market. If the Swiss and Americans had only worked in unison together, they might have commanded the whole watch trade of the world profitably to both nations, but to do this effectually, the Americans must adopt a more effective method of making apprentices, entirely different from their present system of making watchmakers and repairers, which is in many instances, that if a young man can only take a watch to pieces and put it together again, he thinks himself a watchmaker, and will give his opinion on the quality of a watch, or should it be out of order, will in a very wise way tell you what it wants doing to, to make it all right, often quiet the reverse of what it really requires.

After my long apprenticeship and much longer practice, I am not ashamed to say that I can still learn something, for watch repairing on all description of watches, is never learned thoroughly. Will our young watch makers all say the same? I doubt it, for they, according to their notion, know more than their fathers or elders; for we are in a "progressive age." I grant that we are for many things, for general machinery, &c., but not much in making better timekeepers, that will last good as long, if properly and timely attended, as some made twenty to thirty years ago. Of course the improvements in regulating, in labor saving machinery, &c., have been very great since that time. Observatories have been built in Switzerland and America, compensation and isochronism is better understood, as well as rating to heat, cold and positions, but did America discover all that?

My purpose now is to repeat some of my suggestions given many years ago, about watches made by machinery and finished by hand work. For it is well known that machines always had to be used to some extent for making the movements, cutting the pinions and wheels, &c. Although I remember the time when the train wheels could only be cut straight down, and the rounding of the teeth had to be done with a tool made purposely for that purpose, and even it had to be done with a file sometimes as well as the teeth of several pieces used in the repeating part of some, as I can show by some old pieces that I have yet.

I am now giving my opinion about those watches made entirely and the different pieces finished all through by machinery, and

leave it to practical mechanics to judge whether I am wrong in my statements. Also what the consequences will be if watches are all made in that manner hereafter.

Some may say never mind the hereafter, as long as we make money. But if many had in several other cases beside watches, thought more of the hereafter, how much sorrow, trouble and regrets would have been avoided not only to themselves but to their descendants.

Another cause of this rivalry is the great facilities for manufacturing by machinery, the quantity made far exceeding the demand. By competition and by the machination of a number of unprincipled parties in both countries, I should also say in England, for I consider the importer as guilty as the makers who do not value the reputation of any nation, who had watches made in Switzerland and passed off as English or American make, and *trash* made in England with bogus and even real names and passed them off as good and genuine ones.

This was not done by any respectable importers or manufacturers, but principally by a certain class of men who care nothing about character as long as they can make money by it, and are always ready to buy anything, besides taking the advantage of any one who may be straightened in his circumstances, to buy cheap, for they always can find the cash if great bargains can be had; of course there are some honest ones among the number, but they are scarce and far between. I am sorry to say that it is still done with the American watches. It was formerly done considerably with the Waltham watches, but now it is done more with the Howard, as being the dearest of the American make, they can make more by it. The prices of the others, having been reduced so much there is not profit enough to run the risk of being exposed as cheats and imposters, the law is severe in all countries against this fraud, but throughout the world many will be found who can always find the means to evade the laws, particularly in this country, the American public not able to discern a genuine English from an imitation, and often a bad watch were compelled to try an American made one. This was previous to 1860, when the manufacture in this country was yet in its infancy. This watch being large, thick and strong, took the place of the bad English of which this country was flooded with at that time, and which if not well made is the worst kind of time-keeper; no dependence can be placed on it for accuracy on account of the chain and the fuzee with all its gearings of maintaining power, click and spring, and the old fashioned stop work, with spring on the upper plate, &c.,

which if not properly made, had better be dispensed with. If well made as in the fine quality of English watches they are very good, serving to equalize the strength of the main spring. They cannot be applied to thin watches, as the chain takes too much room on the fuzee, &c. The American watch having done away with all this, being more simple, more capable of standing hard usage, easier repaired and cheaper than the really good English, soon drove the bad or cheap kind out. The Americans, who till then had not succeeded in their manufacture, and finding that the Swiss watches of a medium grade were becoming the favorite in this country, instead of importing their movements or parts of them and having the cases made here and being "wide awake," while the Swiss were dozing, went to Switzerland and England, studied and copied the system of watch-making, improved and simplified their machinery beside inventing new ones Then got principally English workmen, as none could then be obtained in Switzerland, where more wages could then be obtained than here. All this took place at the commencement and during our last war when there was an immense demand for watches, particularly good sound, and substantial ones that resembled the English. The watch trade being very dull in England at that time, workmen were easily induced to come over to teach the "Yankees" or "Mud-sills" as they then called the Northern part of America, if well paid for it. This was the time for the Americans to make a "bold strike," which they know so well how to do They built large factories, some with windows all around, for there is no window tax here, put in their improved machinery, worked by steam power of course, employed boys and girls, (I beg pardon, I should have said young ladies and young gentlemen, for in this "progressive age" we have no girls or boys ; now we have children, from which they emerge into ladies and gentlemen) to attend to the machines, which was easily learned. They then formed stock companies, advertised extensively, puffed considerably about making the best and cheapest watch in the world. But the last blow to the Swiss manufactures was the Centennial Exhibition, which was to bring such good times and make all trades revive in this country, as the times were dull enough before. How much they have improved since, I must let the reader decide I cannot give any opinion about that, except bad. Through these several causes the manufacture of watches has got to be what it is now in this country, immense. But I have my doubts as to its being eventually very beneficial to the working classes of watch makers ; I am afraid it will prove as it does so often with incorporated companies,

some may make money by them for a time, particularly the officials, but generally they end in the "big fishes swallowing up the little," which some of them are now striving to do.

I give them all the praise they deserve from the buyers in bringing down the prices, for the present at least, so much lower than they were, but I question if, in the course of time, it will prove very advantageous to the stockholders, as well as to the workmen. This has already been the case with several. Then how many will it impoverish and throw out of work. Then about the quality; they will certainly deteriorate, as they are made cheaper, owing to the competition not only with Switzerland, but with each other in this country, and possibly in a few years with Japan and China, as Chinese are employed in this business in California, who work for fifty cents a day. They are it is well known very quick in learning any light trade and it may yet come to, China *versus* America in the watches as it is now America *versus* Switzerland.

In the meantime let not the Swiss slumber again, but like the Americans, keep "wide awake," and let this competition emulate them so that they may yet compete with the world in watch work, for they have been and I hope are yet a nation that will fight hard for their rights, only give them good, skilful teachers and leaders. I shall have to make extracts from my former editions of this work to show that it is asserting too much in saying that watches made entirely by machinery are the best. I will show what I said to the Swiss in 1868 about losiug their trade in this country, as well as my advice and suggestions to them and also to the American manufacturers, together with my advice about selecting, purchasing and taking care of watches, all of which was given at that time and will now repeat. You can then judge for yourselves whether the advice was good or bad, and if they have followed it or not. It will show you what my opinions were then, after which I will state plainly and impartially what they are now, but first I must again refer to the impression that still remains on the minds of many persons in this country that the whole of the bogus and imitation watches, with real makers' names, came from Switzerland, it is not so, the English ones were made in England and were called *Coventry* Watches, to designate them from the London or Liverpool ones, as plated jewelry was called to designate it from the good, *Brummagem* jewelry, although the Swiss have sins enough to answer for, I do not think it right that they should also have to bear those of the English as well. The difference can easily be detected, as those made in England have the fuzee and chain, and are generally full plates with the brass cap usually put over

their movement, and the movement opens in front. While those made in Switzerland are thinner without the fuzee, and open at the back of the case like the American movements, and are most with half plates or bars to hold the wheels and escapement. I mention this to lighten the load off the shoulders of the Swiss, to whom I said : "The Swiss made a great mistake many years ago, and I am afraid it is still done ; that of putting English and fictitious names upon their watches instead of their own. Had they not done so the really good makers of Switzerland would have been known in America long before this, and they would not have lost so much of their American trade, which I am sure they will agree with me in saying they have done. I do not mean to say that although these watches bore false names, they were not good. I will admit that some of them were very good. Still, it was a fraud on the public, and according to my ideas of honesty, quite culpable. It deserved not to prosper, and it did not.

By continuing this practice for several years and to a great extent, their work was condemned, and they were stigmatized as imposters and cheats ; so that their watches, or at least many of them, were looked upon as disreputable pieces of workmanship, and the Swiss very nearly lost their American trade and the reputation of being an upright nation ; although, until this was exposed, they had enjoyed the people's confidence. But, afterwards, they became afraid of the Swiss watch. By many it was innocently done, they thinking it was all right so long as they received the orders to execute them, not thinking of the consequences. Some, however, of the most respectable manufacturers both in England, where this fraud was carried on, and in Switzerland also, would not receive the orders in that way. But if an order was given they would engrave on the movement or on the case, "Made by ——— for ———," giving name and place where made, leaving it to the honesty of the parties selling it, to properly represent it.

I am glad that they have at last awoke to the necessity of having a good name and of maintaining it. Over thirty years ago, I said that the day would come when the Swiss would repent this to their cost, and I find now that my words have come true. They now see the mischief and the folly of it. The plan that I had suggested was that they should put their own names on the watches that they knew to be good, and on those of inferior quality such as they could not recommend no name at all. If they wished to have them engraved give the proper description of what they were, and not "Patent Detached Levers," or "Full Jewelled,"

on common Lepines and even on Verge watches. But by persisting in this they were encouraging a system of cheating traffic, which they must have known was absolutely wrong.

I am sorry to say that at the present time this deception is still practised, of engraving false names on their imitation of American watches. In England this fraud was not carried on to such an extent, yet it was of engraving the names of good makers on very inferior English movements.

The Swiss are now, as the saying is, "paid back in their own coin," for many who first induced them to do this wrong are now trying to injure their manufacture by giving them a bad name.

When I wrote this ten years ago I did not think that the last part would come so true as I now find it has, but it is so, which cannot be denied. In speaking of the American watches I also said at the same time I would earnestly recommend to all manufacturers of American watches, if they desire to make their manufactures permanent and lasting, not to relax in the quality of the materials and the metals used, or in the finish of their movements, for if they do they will assuredly share the fate of the "Yankee clocks," as the English call them. Those wishing clocks durable and to be depended upon, are going back to the English or French make, unless they have an American made one of very good quality, such as are made by the Waterbury Clock Company.

Strive to be continually improving your works and never make a movement without a stop work ; any kind will do, if made to stop at the center and not at the end of the main spring. Let not an imperfect article leave your factories if it can be avoided, particularly in fine watches, for if you do the English will keep the lead for large watches and chronometers, and the Swiss for the small and complicated ones. The latter people have been improving their work very much of late years, and will continue to do so, if they are paid a fair remunerative price for their labor, for remember the Swiss like the Americans are a persevering, skillful and industrious nation, and will not allow any other to excel them in watch work. There are so many in that country depending upon this business for support, that they are stimulated all the time to keep improving themselves and perfecting their watches."

I now must beg of the reader to remember that what I said to both, was ten years ago, when I think the Americans did not claim to make and finish all their watches by machinery alone. They might possibly their inferior grades, but not their finest ones.

The Swiss have followed my suggestions in having their own names on their watches, yet I find that there are still many watches

made with false or bogus names, not as formerly with English names, but with those of some of the most celebrated makers of England, Switzerland and America, but altered in such a way by either adding or suppressing one or two letters that they may evade the law ; and it requires a very good judge to detect the difference, of the genuine from the imitation, not only in the movement, but in the case. The American manufactories, or at least some of them, have certainly very much improved their watches in the last few years, and made wonderful progress in watch work, and I would again name the Howard, Boston, the National Elgin, the American Waltham, Springfield, Ill., and the Springfield, Mass., as the best, that is if they do not get too much in the cheap system, as I know that any one in almost any mechanical trade using himself to work on common or inferior articles, finds it very difficult to return to the fine. I think that many good artisans will bear me out in this assertion. I have always found that it is more trouble to do good work, after making common for some time, than to learn to make good from the first.

Unfortunately, this cheap work is not made now for the purpose of driving the bad English watches out of the market, for that is pretty well over now ; but it is for the purpose of driving the Swiss ones out also.

Appertaining to these suggestions follows what I also said to watch purchasers. After giving a list of some of the best makers of England, Switzerland and America, I must here observe that in clocks there has been a very great improvement in this country, both in the style and quality, in a few years, particularly in those of the Waterbury Clock Company. But I am not discussing clock work, but watches. I said then, and again repeat, "I speak of all these makers from my own long practical experience with the makers and quality of their works, having had some of each kind through my hands to clean or repair. But I must again impress upon the minds of the inexperienced in the trade, as well as the public, wishing to obtain a watch of any particular maker, to get it of reputable parties, of those on whom you can depend ; to get the genuine movement as well as the quality of the gold, etc., in the case, as there are still many imitations in the market—I may say, perhaps more than ever.

Some may have been foisted upon the inexperienced in the trade, by reason of their not being able to detect the difference, which it is in many cases difficult to do. I believe that few can detect the difference between the genuine and the counterfeit watches, particularly now, unless he has worked in the factories

of England for English, those of Switzerland for Swiss, in Geneva for real Geneva watches, those of Besançon now for French ones, and those of America for American, or have been practical workmen for some time themselves," for there is in every different factory a particular style that only practical men can detect. Although many changes have taken place in ten years, this is still my opinion and my advice about choosing a watch, given at the same time. "The person who wishes to obtain a good time-keeper should apply to a watch-maker or dealer, of well-known honesty and ability in his art or business, and who therefore should be implicitly trusted. This will apply also to jewelry of every kind as well as to watch cases, and to clocks also. The various prices will generally point out the comparative quality of the works, although I must here observe that often *fabulous* prices are frequently paid for some particular or favorite names, when other makers may be just as good, and can be obtained for much lower prices, for the days for fancy prices are about over.

The external of a good time-keeper forms but a small portion of the expense, unless it is very richly and elaborately enameled. In regard to chosing either an English, a Swiss or an American movement, circumstances must in many instances determine that. There are good makes in each country. Be sure to get one with the genuine name, if you have a preference for any particular maker.

For a moderate size one, and if you want a thoroughly good and lasting time-keeper, take an English, for I still adhere to my old notion—ridicule it if you wish—that if you are able to pay the price, there are no better watches made than a good English one, with either a duplex or lever escapement ; compensated balance, properly adjusted, and it cannot be excelled for durability and good performance, etc., under all circumstances. The chronometer escapement although the best of all, I cannot strongly recommend for the pocket. It is too delicate for any sudden jar as riding on horseback, jumping off the trains, etc. I still maintain that to properly equalize the strength, of the mainspring the fuzee is useful if you wish something perfect. Still if the mainspring is made properly to draw equally, and with a good stop work to equalize its strength, a watch with a going barrel can be made to keep as correct time as any person can desire. For one of about the same size and thickness, and if you are travelling and are going where you may not find any very skilful watch repairers, take an American one. The price will generally regulate the quality. They are more simple, easier repaired and will endure harder usage

than any other; they have been much improved since the competition has been so great. For a thinner, or a smaller, carefully finished or complicated watch, especially for a lady's size, choose a Swiss one, for they certainly are to be preferred either for small sizes and for low prices, for the same quality in comparison to any other.

As for stem-winder of any makers, be sure to get them only on good watches, otherwise you had better get the key winder, for a poor or common stem winder will be a continual source of trouble and expense to you.

But I find that I am running away from the subject that I intended to write about at first—the comparing of hand made and machine made watches, so "touch the fly back to the chronograph," and begin or start again.

The English certainly must have the praise of being the first to make chronometers, duplex and lever escapements, and even the cylinder, which when the ruby cylinders were made, could be regulated as close as any reasonable person would desire. They were also the first to properly apply and make the compensation balances for watches They were the discoverers and the first to make cutting machines, whereby the teeth of the train wheels could be cut and rounded at the same time without removing the wheel from engine or cutters They were the first to offer prizes, not merely medals, for the *best* Chronometers, not for handsome finish, but for the good performance of their works.

Where will you find better chronometers or watches than those made by Earnshaw, Arnold, Barrauds Brockbanks, Frodsham, E. D. Johnson, F. B. Adams, T. F. Cooper, Hoddell, Chas. Taylor, Guillame and even M. T. Tobias and R. and G. Beesly of Liverpool. But any of these must be genuine to be really good. For complicated and finely finished, sporting, calendar, repeating and plain stem-winding watches, I consider at the present time that those made by Nicole, Nielson & Co, late Nicole & Capt, of London, are as near perfection in the art as any that I have ever seen. The French, although not now manufacturing many for exportation, must not be omitted, as they were the first to apply the going barrel to do away with the fuzee and chain, whereby thinner watches could be made. Any statements to the contrary are incorrect. The English followed after, for their flat watches, before the year 1815. When I worked at the trade in London, when a mere boy, I saw them in use then. The Swiss adapted it about the same time, for their cylinder as well as for some of their

verge watches. That was long before Americans thought of making watches.

In France Breguet was the first to apply isochronal mainsprings, and were and are still often called Breguet hair-springs. We must not forget such names as Lepine, the inventor of flat watches, Le Roy, Oudin, Audemars, etc. They were the first to reduce the sizes and thickness of watches for general use. There certainly had been some very small ones made before, but I am now only describing those for the use of the public at large.

The inventions and improvements made in America on the movements, have been the "Foggs Patent Pinion," whereby the recoil of the barrel when the spring breaks, prevents the teeth of the train wheels or barrel as well as the leaves of the pinions from being injured. They also invented several different kinds of "Patent Regulators," to move the regulator to much more nicety than could be done by the old way of pushing it with the hand toward fast or slow. All these are certainly improvements and are good, but there are some things the *invention* of which they claim that I cannot or will not admit. I have been too long in the business not to know something about it ; I am willing that they shall have all the credit and praise that they deserve, but as I started with the promise of being impartial and only stating "what I know," I must keep my word good as far as possible. The Swiss must have some credit for the great perfection that they have attained in finely finished and complicated as well as pretty and tasty watches, and also for being the first to make watches by machinery. It is the house that I referred to in "The Watch" in 1860, although at the time I did not give the name, I said, "That there was in Geneva a manufactory where watches were all made in the same building, etc." I alluded to the house of Vacheron & Constantin, which is still in existence, although the name of the firm has been somewhat changed, but not the quality of the goods, which have rather improved than otherwise. I may safely say that thousands have passed through my hands, and I always found them good ; but although they are made by machinery they are finished by hand, and I am still of the opinion that good time-keepers have to be, to be long reliable. They had also every part made so that they could be duplicated at any time, and although they had several sizes they only had two qualities of movements, so that the Americans cannot rightly claim to be the first to make watches by machinery. These and many other Geneva watches have never been excelled for their good performance, and like the best English, are noted for durability and accuracy, yet like all

finely finished or complicated watches, of any make, they must be put in good, skilful and honest workmen's hands to clean or repair. Unfortunately in this country there is a scarcity of really good and honest repairers. They will after some time, if not properly watched, get careless ; but I suppose it must be on account of the "progression" of the age. As "fair play is a jewel" in every country, I certainly give the Americans credit for simplifying somewhat the movement for improved machinery, improved regulators, patent reversible pinions, etc., but I can not admit that they invented the machinery-made watch. They certainly deserve great praise for all they have done in favor of lessening the hand labor in watch work, but I do not think that they have yet obtained the victory over Switzerland for watch work, although I grant they have in machinery of every kind. The buyer ought to be thankful that they have lowered the prices, but whether the quality will be sustained or improved by it, time will show. For my part, I doubt it. Switzerland can boast of such makers as Jurgersen, Ed. Perregaux, James Nardin, Chas. Tissot & Son, Borel & Courvoisier, A. Huguenin-Nardin, Lutz Brothers, Perret & Co, the Star Watch Co., of Geneva, Philadelphia Watch Co., Paulus's Patent, A. Huguenin & Sons, and a host of others, not forgetting Beguelin Houriet, of Tramelan, who I consider, without fear of contradiction, has sent as good watches, for the price, as any other maker in Switzerland. I examined the first ones that came in this country twenty years ago. He made many for me with my name on. I have always and do yet recommend them for their good performance and durability. Between the years 1814 and 1826 there was a great competition and rivalry between England and Switzerland about repeating watches, and it still exists to some extent about plain ones, but to the credit of the *big* nation, it did not attempt to crush the little Republic, but rather tried to help along its industry. One proof is that all watches now enter England duty free. They worked in union together. The movements were sent from England to Switzerland ; as I stated before, the Swiss never made many with fuzees. The repeating parts were made, the trains also for them pivotted and finished. This could be done for half the price paid in London, and is still done. Many movements without the fuzee are made in Switzerland. The escapements, compensation balances, jeweling, engraving, gilding, and dials and cases, are made in London. This is also done here in some cases, the movements are imported and sometimes jeweled, gilt and the cases made in America.

I thought the Americans would have been satisfied with what

they had already achieved, which was certainly wonderful in so short a time, and let their watches take the place of the English ones which they had driven out of this market, but no, they must go further yet and try to drive the Swiss out as well.

There was enough made in both countries together to have supplied the whole world. I supposed that the Swiss now putting their own names on their manufacture, would have been satisfactory to them and that by exhibiting in Philadelphia, they as well as the Swiss wished to show the world what could be done in both countries in watch work, but unfortunately it has brought on all this *pivot* war which will only be the means of increasing the number of *tickers* to the detriment of the working classes in that branch of commerce. As many of my readers may not know how the ship chronometers were rated and tested in England, I will tell them. Some of *my friends* among *watch-makers* may laugh and say, when before I endeavored to relate and explain anything which I thought some would like to know, "Why, we all know that," I wish to remind them that what I write and publish is not for the trade alone, but for general information for the public.

The manner of testing the accuracy of chronometers was thus: After having been well regulated and rated to heat and cold, the different positions are not so necessary as in a watch, as a ship chronometer must always be in the same position, with dial up; hence the double swing boxes that they are all fitted in. They were then sent to the Observatory at Greenwich, where they were again rated as close as possible. After that, they were locked and sealed in such a manner that nothing could be done to them except to wind them up and keep them going all the time. They were put on board a ship under charge of some competent person to wind them regularly, then sent on a voyage round the world, to the East Indies, China, etc., and back. This at that time took over one year to accomplish; on their return they were unsealed and opened and the rates compared by the same Observatory, and first, second and third prizes awarded, which at first amounted to twenty thousand guineas or one hundred thousand dollars, rewards well worth contending for. The same thing was also done in France for the French saw the importance of it for their own navy. After as near perfection as they thought could be obtained, the prizes were not awarded. But now not only chronometers, but also watches as well, are tested for the honor and credit of the different manufacturers. The latter, however, are not sent on a "voyage of discovery," but shifted from an oven to an ice-house for the space of three to four months and the watches tried in different positions

as well as to heat and cold. My opinion about properly testing a watch, is that after having gone all through this process, that they should be subjected for some time to all the different motions that a watch is subjected to--such as running, jumping, walking, traveling by rail, both by steam and otherwise; but of course that is not possible to be done with many. The only manner in which to know if you have a really good and accurate time-keeper, is to see by a good regulator if your watch goes regularly the same every day or week. Whether it loses or gains it can be regulated, but if it loses one time and the next time you compare it, it gains, then there is something wrong about it and it will not rate. I must be understood that I am only speaking now of the *finest grade* of watches.

I have known engineers and conductors on railways tell me that if they do not travel on Sundays, or for some days, that there will be a difference in the rates, no matter how fine a watch they may carry. English, Swiss and Americans are all liable to this. I maintain that any watch, no matter how close you may have had it regulated, when not in motion, when worn, and by different persons, following different callings or occupations, will vary somewhat and will therefore require to be regulated again to some extent. Certainly there will be but little variation in some, but more in others. I am so particular in describing all this, because I have and I doubt not, other watch makers have found the same, that there are many persons that wear watches, who almost ask impossibility in a time-piece, that is subjected to all the *ill usage* that a watch often receives.

There is sometimes found in cheap watches or medium grades I do not mean in *trash*, some that will run nearly as close as the best, under all their trials, but it is "chance work," and cannot be expected by any reasonable person, particularly for any length of time. I have heard some say, "I had a fifteen or a twenty dollar silver watch that kept as good time as any two hundred dollar one. Now I paid perhaps three hundred dollars for this, and it does not regulate as well. What is the reason." My answer to such men generally is: "Perhaps you had your twenty dollar watch in good hands, to repair all the time, still you were not satisfied, but must change, because perhaps he did not have a large and showy establishment and had not a great display, but done perhaps the work himself or directed his workmen how to do it, which, according to the present ideas, is degrading, if the orders do not pass through two or three hands, or there may be some little fault about it which has been over-

looked, particularly if he is not a thorough practical workman himself." And again, if you buy a ticket in a lottery, can you expect to get the highest prize all the time? How many times will you have to try, as you might have had, to succeed in getting as good a time-piece for twenty as for two or three hundred dollars? I must do justice to all in saying that I have seen some very close running in the Howard, the Elgin, Waltham and Springfield watches, but although they are made by machinery, I think they will acknowledge that their *finest grades* are finished by hand.

I am now defending the watch made partly by machinery and finished by handwork, against that made *entirely and finished by machinery*; also which will prove the most durable, accurate and reliable as a time-keeper.

I have to be particular to explain everything very plainly, even if I run the risk of being ridiculed and jeered at, or some of my "friends in the trade" will find some *technicality* for which to blame me.

The question is now, which is the best, a movement made by machinery and finished by hand work, or one made and finished entirely by machinery Of course the putting up, adjusting and regulating must be done by hand. I do not suppose that all you have to do is to put the pieces together and in their places, and after putting the movement in the case, it is all ready for the pocket. Unfortunately some remarks made in Switzerland have been construed to mean nearly that; hence arose so much bickering and paper war between both parties. My opinion, if worth anything, is, and always has been, that a durable, accurate and reliable time-keeper, should be partly made by machinery as they always have been, and finished by hand. Of course, I am but one against many, but I repeat again, time which unfolds many things will tell.

The improvements that have been made in this country, has not been in the movements alone, but also to the making of the cases. I admit that to be a great one, better perhaps than some on the movements, because that does not interfere with the accuracy of the time, it is another great labor saving invention good or bad, in that many differ. For my part I think there is more bad than good in it. It has certainly lowered the prices for making the cases. (The gold or silver, if *of good quality*, is the same price.)

It is very convenient when you want a case in a hurry to get it ready made, put the movement in it and the watch is ready. "Never mind if it does not fit very close round the movement, the dust

can get in easier, and it will want cleaning sooner, or whether it is too high or thick, or whether the shutting or opening will last, and many other faults that would not pass in one made by hand. It is cheaper and more money can be made by it on the sale, and the wearer will not notice the difference." Cases when hand-made, are certainly prettier, shut, fit closer, and look better in every way than machine-made ones. Let the reader look at some made in London, Geneva, or Locle, and even here, when hand-made, compare them together, then give your opinion and decision in as impartial a manner as I am writing this.

Remember also the number of men it has thrown out of employment ; but some will say " never mind the men or their families, we cannot put them in our pockets, but we can the money we save by not employing them." *Considerate, humane and Christian men!* Now for the movement again. It is well known by good watch-makers, that a slow beat movement will not regulate under all circumstances as one will with the 18,000 or quick beat, which all the Swiss good movements have, The English always had it in their duplex and the French in their cylinders. Most of the watches made in America have the 16,400 beat which, in my opinion, is not so good for accurate time in a watch subject to jarring and much jolting as it is likely to have in travelling. There are very few persons among the many that carry them who ever think of the complexity of their delicate mechanism or of the extraordinary and increasing labor they perform. Hence the necessity if you have a good one of having it looked to at least once within eighteen months. If it is a small one, in less time than that if you wish to preserve it good.

Any one that tells you that he will warrant it to go correctly for two or three years, as some do, without cleaning or repairing, is deceiving you, and does not deserve the name of a watch-maker; he is only a seller. There are many who think that it ought to go and keep good time for years, without a particle of fresh oil or without any, who would not run a common piece of machinery of any kind—even a wagon or carriage—without oiling, which do but a fraction of the service of some parts of a watch. It is true that one with jeweled holes will go long longer than one without ; but the jeweled holes must be very smooth and well polished, and the wheels as hard as it is possible for brass ones to be. They, as well as the plates, if brass, should be hammered, not pressed, as is done by machinery. It is well known and acknowledged by artisans of brass, steel or iron, that the quality is much more improved by hammering than by pressure. If the jewel-

holes are not well polished and the pivots very smooth, a watch without extra jewels is better, if the brass is hard and the pivots well polished. I have always found that an old-fashioned English, Swiss, or French watch, without jewels, except to the ballance staff or escape pinion, would go better and last longer in order than many of the so-called full jeweled ones. I am sorry I cannot say the same of the machine-made watches of America. The plates are softer as well as the wheels and pinions. Balances with brass and steel combined will go better than the plain steel ones, but remember that a balance to be compensated, must be made in a peculiar manner. It is not merely by attaching or soldering brass and steel together. The brass must be melted on the steel, and in proper proportions, and after it is properly made, it has to be cut before it will compensate, that is why we read and hear so much about cut balances ; they certainly are necessary for accu rate and correct time.

I will now tell you what work the movement of your watch does, which, although it seems almost incredible, is nevertheless true.

The main wheel or barrel if without a chain makes 4 revolutions in 24 hours or 1460 in a year ; the second or center wheel 24 revolutions in 24 hours or 8760 in a year ; the third wheel 192 in 24 hours 70,080 in a year ; the fourth wheel, which carries the second hand 1440 in 24 hours or 565,600 in a year ; the fifth or escape 12,964 in 24 hours or 5,526,000 revolutions in a year. While the beats or vibrations in 24 hours are 432,000 or 157,530,-000 in a year. Does not that astonish you, yet it is so, and shows the necessity of having every part and action *perfect*, and kept clean, and properly oiled. Is it to be wondered, that I say that no good workman ought to warrant a watch for more than a year without cleaning, as that is as long as the oil can last good in the pivot holes. The watch makers and dealers in this country or many of them do not attend enough to this.

They will take a movement or a watch that has perhaps been made for years, sell it, wind it up and set it going without first cleaning out the old oil from action on the pivots and he is often blamed for having sold a watch, that does not go correctly, or only a short time. This may do when the purchaser is handy to the seller. He can call and get that rectified but if he is going any distance it cannot perhaps be done, particularly if a very fine or complicated. Forit is well known that oil will corrode or decay, no matter what kind you use. But as I advised before, give it always if possible to the person from whom you purchased it or to some

workman that is trustworthy and honest with his work, as it will be to his interest to do it properly or get it done by some workman in whom he can trust.

If you have dealt with a watch maker or jeweler that you have always found to do what is right in his transactions, do not try others if you can help it. Should there be anything wrong, tell him candidly why you change, and if he is honest and fair dealing, he will correct any oversights, errors, or mistakes that either himself or those in his employ may have committed. For I say it boldly, there are but few trades or callings in which a dishonest person can deceive you as easily as in watches or jewelry.

If a ship's chronometer has been a long voyage, on the return it is all taken to pieces and thoroughly examined. If the pivots are worn or even scratched they are repaired and repolished, then it is rated again, that is the reason that many vessels have two, one they use while the other is being cleaned or rated. If there is strength enough in the main spring of either a watch or chronometer, they will go for a long time, but they will not rate. What is meant by rate is that the variations *if* any, shall be the same every twenty-four hours, whether they lose or gain. When I mentioned the slow beat, I alluded to the old fashioned rack levers which at first was only 14,000 and after the patent lever 16,400, but which were more liable to be affected by external motion. The 18,000 was after adopted by all good workmen as being the number that was the best according to the principles of horology, 20,000 was tried for a short time, but soon abandoned as being too quick. The reason why the rack levers and the Chinese or double tick duplex had to be abandoned, was because the beats were so slow that they could not be regulated accurately when worn. There are some things which must be admitted by any impartial judge of watch work, if he will be truthful and candid in his opinions—that, in the first place, all metals are better and more durable by being made hard, by hammering, than by rolling or pressing, and also that in the English or Swiss watches—good ones, I mean, not in the *trash*—that both nations sent out here some years back. But in the medium or good qualities, and in the finely finished and complicated hand made, the plates are harder if of brass, and the wheels also, the pinions better tempered, etc. I maintain that in those made entirely by machinery, the teeth of all the wheels will wear out of shape sooner, that the holes, when not jeweled, will get too large quicker ; even the taps or threads, for the screws will wear out more than in those made by hand work. As for all the pivots made of such a uniform size, and pinions of such

exact height as it is said they are when made by machinery, I must candidly say that I have had to alter many, although we are told, that they can all be replaced and obtained whenever wanted, and they will be all right without any alteration. In some the shoulders were too high or too low, or the pivots either too small or too large. Some of the pallets or forks had as well as the depths to be corrected, and several other alterations to be made, which, although they were not such serious faults as would prevent the movement from going for some time, but it would be without any regularity. Now the wear of the machinery of the cutters, polishers, etc., must cause some of the pieces to be inperfect after a certain number have been made.

Therefore, if the examiner or putter up, is not a good skillful and experienced workman, some defects will be left uncorrected. In such a fine piece of mechanism as a watch, the least deviation from the true principle will prove injurious to the quality as a correct time-keeper. In all the finely finished American watches they must own that hand work has to be used more or less as well as for the Swiss ones.

As for the statement that turning by machinery can be done better and more true than by hand, I cannot admit that, either. I can show some turning that could not be excelled if equalled by any machinery. It may do very well for some grade of goods, but I doubt if it could be used for as fine and conical pivots as are found in many of the best Swiss and English watches. It is well known that the finer the pivots, together with more and finer teeth to the pinions and wheels, the less friction there will be. And that one that will regulate with a weak spring and a heavy balance will be more durable, keep more accurate time, go longer without repairing, etc., than one with a strong spring, as is the case with clocks used for regulators. I also will not admit that the polishing of either the pinions or the pivots can be done better by machinery than by hand ; having pivotted and finished so many myself that I believe I know something about it, not by theory, but by practice.

I am in favor of machinery, in many cases it is even necessary to keep pace with this "progressive age," but my opinion is that it has done more harm than good for the benefit of society and mankind. I certainly believe that applying too much of it to watch work has not proved beneficial to the working classes For clocks, its use is necessary on account of their cheapness. Neither has it improved the quality of the watches, for beauty, durability and accuracy, &c., of their running. In how many cases has it

already been the means of impoverishing the working classes for the benefit of a few already rich.

In Switzerland and in England the best watch manufacturers are usually, or have been, practical workmen themselves, having learned one or more branches of that art, such as escapement making, finishing, or even beginning the movements, etc., the most important branches of that trade.

They do not usually form companies and have, as some have had, men at the head who know very little about the practical part of watch-making, except the theory, frequently learned from books, therefore are not able to judge if the work is done properly or not, or competent to know if the manager or foreman knows much more than they do themselves, and then go on, till other companies starting, they are compelled to make cheaper goods and lower the wages, or pay off the operatives for competition with each other; after a while making them so cheap and so bad, that there is no more demand or sale for them and they "go up" in a "baloon," and the poor worker has to suffer. Not them. "Oh no" they have taken care of themselves beforehand.

This has been the case in this country, in only the short time that watches have been made so extensively by machinery, and it may be the fate of others if they are not careful. But I hope that some that are in existence now, will profit by the lesson shown them by others, as well as the Swiss will profit by that shown them at the Centennial Exhibition of Philadelphia.

There is one remark I must make to them. It is that they have never been particular enough to have their medium grades of movements, properly regulated before leaving their hands, and Americans knowing that, have had the advantage over them.

Before their movements are sent from their factories, put in the safes or offered for sale, they are properly timed and regulated. That is the reason why in taking any one promiscuously from a number of others it will often go very accurate, as was the case with the one that M. Favre Perret took, and which has caused so much mischief. A watch manufacturer in Switzerland as good on fine watches—I do not mean on the "trash or patraque"—makes it his duty to improve himself all the time, not for cheapness or quantity, but for quality and superiority over others. He is from his knowledge and experience enabled to see if every part is made properly and on the right principle of horology. They are generally all friendly toward each other, and try to assist others in new discoveries, etc; in fact they act in unison together, and by these means have attained almost perfection in watch work.

But somehow, I do not know whether it is in the climate, in the air, in any imperfection, or by example, or what else, but after they get here they change completely, or appear to. They inhale the spirit of jealousy, envy, opposition, competition and making money fast without laboring hard for it, so common in this country. Of course there are many exceptions, but still it is so with some.

I will now state how in many instances watch makers and repairers are made in America, and I have no doubt in other parts of the world ; but I only speak of what I know. A man or boy has been working in a watch factory where the movements are all made by machinery. He may have been only attending to some particular machine used in making some different parts, as balances, barrels, wheels, pinions, pallets, forks, regulators, or hair springs, etc. He may have been the examiner or putter up, gathering and putting the pieces all together, and seeing what he supposes to be so very easy as a good, practical workman, in putting up or examining a movement, if he finds anything wrong will soon correct it without letting the "looker on" know what he is doing or what he is doing it for. After the movement is together and wound up, he finds that it goes like a "living thing," as Mark Twain says. He then thinks, now I can be a watch maker. He selects all the different pieces, as he has seen it done, puts them all in their places or holes, although sometimes upside down, never mind if he breaks a pivot, bends a wheel or cracks a jewel, or twists a hair spring or loses any screws, etc.; "there is a few more left of the the same kind," and so quickly and easily made by the machine. After having screwed the cock down he finds that the balance goes and the escapement *ticks*, he says, "Now I am all right. I can put a movement together." Remember that we are told that in movements made entirely by machinery, every piece is made so uniform that any part can be duplicated by sending for them. So the reader can see how easy it is to learn to be a watch repairer. Oh if I was only a "boy again," what a long apprenticeship it would have saved me ; but then we had not arrived to this "progressive" age yet. After this boy or man leaves the factory he opens a store and puts up a sign, "Watch Maker, from such a well known factory."

Again, a man is employed as clerk or salesman in a jewelry store, where a watch maker is at work, perhaps a botch at that. By continually looking over his shoulders or leaning over him while at work and hearing him endeavor to explain some of the defects to the customers, of which he knows perhaps as much of

as I do about building a house, and that is but little. Again, he may have been a traveller for some establishment, selling watches and jewelry, and knows no more about their construction than winding them up, setting them to time, or be able after considerable patience to describe the different kinds. He thinks also that he is competent to repair them. There are others who only know how to wind and set them to time and make them look very bright and shining on the outside, but have, or their fathers before them, had money, their idol, and wish to start in some business or speculation to make more. I must here observe that this class belong to those who have done more injury to the watch and jewelry trade than any other. They are not generally a working class, except in speculations or head work. This young man, wishing to go into a business that is certainly respectable if honorably and honestly followed, for it looks so nice to see a watchmaker at work handling all the different pretty wheels and pinions, balances, jewels, hair springs, tiny little screws, etc., and after holding the plates, brass wheels, etc., in a piece of tissue paper, brush a little, make them shine, etc, put them all up together, and after winding the spring up it goes like any other mechanical toy. He perhaps says, "Now I will not only sell jewelry, and watches, etc., but I will also repair them, and *work* at that, it so much *nicer* than being a *dirty* mechanic, such as carpenter, wheelwright, engineer, shoemaker. Why, I can sell them as well as clothing, and make more money than by making them myself; besides they are made so cheap by machines—in fact, I can not be in any business where hard work is required." As for farming, that is altogether too laborious, and it would spoil his complexion or harden his hands too much, particularly if he should afterwards want to go into any fancy goods business should he not succeed in this, for I must render them justice in saying that they are very persevering and good salesmen. I have been a farmer, and all my six sons were brought up on a farm, and was I young again, would certainly choose that manner of getting my living, as it is, if not afraid to work, the most independent, healthy, and one of the most honorable of occupations; for a watch maker or repairer has to put up with so many vexations, accidents and insults, that he must either be as patient as Job or act the hypocrite, not to get vexed and be often *wicked* or profane. His work, unlike any other, seems never finished, owing to the many disarrangements and often carelessness of his customers, to which a watch is subject. Now "brother craftsmen," good ones I mean, am I right or wrong? But I had almost forgotten my young ap-

prentice, who having now concluded to repair watches, puts on his card besides dealer, "practical watch maker." Now what kind of a repairer will he make? We will suppose he employs a workman. If he does, it must be one who will work very *cheap*, and therefore cannot be expected to be very expert or skilful at the business. If he has not learned it himself or been taught by a good practical workman in all the different branches of the watch, how can he tell if the work is done right or wrong? If not properly done, how can he show him how it must be, to be done well?

This will apply to many other mechanical trades besides watches or jewelery. This shows the importance of establishing industrial schools in this country as well as in Europe, where every branch could be learned, even repairing by hand work as well as by machinery, to be taught by competent and practical as well as experienced teachers. For I have always and still maintain that a *good* watch repairer *must* have experience combined with practice. A workman that has learned his trade in England, France, Switzerland, or even Germany, by hand work, can generally find employment, but I have my doubts if he could as easily, if he had been taught in a factory where the watches are all made by machinery. I have had many apply to me for work, and when asked where they had worked or been taught, would answer in such a "factory." "What branch did you learn?" "I made balances or pinions or barrels or I am used to putting up, regulating, and so forth, from one end to the other." This is the kind of repairers we shall have in a few years in this country.

The aim of the *good* makers in England and Switzerland has been to keep doing their work as well if not better than formerly, and in such a manner that their names may be transmitted to posterity, as several have been, and others will be in future. They endeavor to improve all the time and to impart their knowledge to their descendants.

But now the rising generation care but little about name. They care more about making money without work or any manual labor. This is the case in more trades than watches and jewelry. If you make all watches by machinery *alone*, where will you in the course of a very few years obtain your repairers, the number of good ones which is decreasing yearly in this country. It is not by writing that you will make them. The number required could not be obtained unless they came from where watches are made by hand work. It will perhaps be as with clocks, some can be bought now so cheap, that when out of order, it is cheaper often to buy a new one than have the old one repaired. It will not be by being a

putter up or adjuster and by knowing how to make pieces in a factory that they are made. If he has a new piece to make for a watch made on the old principle of watch work or for one of any different kind of maker, how will he ever begin to go about it. For there always has been and will always be such things as broken staffs, pinions, wheels, main or hair springs, etc. Some will perhaps say, "He can get it from the factory or of any dealer in materials." Now I know that but few of the dealers in materials keep the pieces finished ready for use for the different kinds of watches, and many of the jewelers in country towns do not even know their proper name. Another evil will be that by so much increasing the quantity, what will you do with them all, for as I said a person having a good one, does not wish to part with it, after he is satisfied that it will keep time and he can rely on it. It takes too long to try the quality of another.

What will become of the 40,100 hands or workmen employed in Switzerland alone, in watch-making? Some will say, let them follow some other trade or calling. What trade is worth following now, and will according to all appearances be better than those in existence at the present time? and where a workingman or woman can get even a comfortable living if in steady employment? What new trade or branch of industry could be started in such a small country as Switzerland? Besides money for stock companies cannot be obtained there as easily as in England or America. They have not so many banking institutions, neither are they so fond of paper money.

Others may say "go West," "there is plenty of land to cultivate." Where is the money to get there and buy the land. For if they do not pay for it, but have to pay interest as well as raise enough to live upon, they will have but a sorry time out West. They may certainly, if willing to work make a living, but not more, as I am afraid many can testify. Although I will admit that where there is a large family all willing workers, that they can live by farming in a comfortable and independent manner, but they must not expect to get rich by it. But as a general rule the Swiss, if they can only live in their own country in tolerable comfort, even if they have to work very hard at their trade, love their native land and mountains too well to leave them, unless compelled by necessity. Yet, unfortunately, many after they have left it, love money better.

I say boldly that it is not honorable, just, Christian-like or acting on the square towards all men, to try to crush their manufactories. Competition is necessary in every trade or calling,

but it should be done in a fair and honorable manner without using any subterfuge to obtain it, but now, many good attributes appear to be lost when self-interest is concerned. So is it not unjust after having learned what they have of the best part of watch-work from the Swiss? some of it I acknowledge from the English, except the going barrel, which was a French invention. But the most essential part to them was the machinery, For it cannot be denied, that the Swiss were the first to employ it to any extent in Geneva, in watch-making. I call it ingratitude, which in my belief is one of the worst of sins. For it is certainly a fact that the machinery of Ingold (who is still living in Switzerland), was first used in Boston in the year 1852 where the first American watches were made.

It resembles too much of the boy or clerk, who having learned what he knows from his father, or from his master, after having found the means to go in the same line of business, which he has a perfect right to do, if done in a legitimate or fair manner, will after he has started, and they are going on in a friendly manner, with trade enough for both, says, "I want the whole of it." I am going to break up the old shop. I can do it for I have more money or credit than him, besides he has so many "old fogie" notions and does not keep up with this "progressive age." But it often happens that the young attempt to carry too heavy loads and break down, which many and experienced, although much older, find no difficulty in bearing. This has been the case before this, and may be again.

I feel grieved that this controversy and competition should have occurred between these two nations, both republics. The Americans should have been satisfied that they had nearly driven the English watches out of this market, as they had done the Britishers a centuary ago, and leave their little sister republic alone. For I say again that had they worked together, which they may do yet, and by doing it, the whole watch trade of the World could have been divided between them. But now with so much machinery, there is no telling how far the competition will spread ; I have no doubt to Japan or China. In this country it will reach a point that the weakest must give way to the strongest.

The reader must excuse me for using so often the term "progressive ;" this was said to me when I told certain parties that I intended to issue a third edition of "The Watch." I have always agreed that machinery was necessary for many things of every day use, and in some as great labor saving for a number of articles, but I thought that it was not any more required for watch

work than it was in 1868. I would beg leave to ask in what way or manner has this "progression" benefitted the working classes, whose interests I am now trying to defend? Has it made either of the sexes more moral, more honest, better citizens, better fathers, mothers, brothers or sisters than formerly, or healthier and happier than before? Are not many of the establishments wherein so many boys and girls are employed very often detrimental to the morals of the young, as many of the publications issued at the present day are, for you all know the old saying, that "one unruly sheep will spoil a whole flock," and a diseased one "can poison them all?" It has been the means of creating more indolence, more luxury or outside show, more extravagance, more paper money for the benefit of speculators, more gamblers or stock operators, more swindlers, more offices and seekers after them, more insurance brokers, etc., as well as increasing the number of "drones in the hives," for such I call many who get rich through the toils of the working classes, often without paying them a fair remunerative price for their labor. At least that is my opinion, which may not suit all, but of course in all countrys, opinions will differ, and for the good of society, it is right that they should ; in many cases opposition is necessary. In Switzerland, in England and Germany it is customary for the children to stay at home with their parents till old enough to be able to judge for themselves what trade or calling they will follow,.for it is not every one that has the genius or capabilities as well as patience to be a good watch maker or that likes it well enough to learn it properly. In such cases it is better for them to choose some other calling. If the father should have rendered himself celebrated as a superior or honest workman, the name is after handed down to the third or fourth generation. Whether it is best so or not, I do not pretend to say, but leave it to others opinions to decide, but I know that such is the case. My grandfather was a clock maker, my father was in the same business. I think that I can claim to be a watch maker and repairer, and have two sons watch makers and jewelers. How much longer it may extend I am not at present prepared to say.

I must candidly say however that I do not believe (in certain cases excepted) that the American boys "of the period" will as a rule make many very skilful and good watch repairers. He would not have patience enough to sit still and under control sufficient time to be taught properly. They think that a trade can be learned in one year or two at the farthest. I will tell him, believe me or not as he chooses, that to be a *good* repairer, even under the present system, it will take him four or five years to be able to re-

pair all kinds of watches. It took me seven years to learn one branch of it properly, the making of the repeating parts ; then six years more to learn two more, the escapements and the finishing and adjusting. As for the repairing, at which I have worked at on all kinds of watches since, I am not ashamed to say that I am still learning something; I am not so foolish nor so presumptuous as to say that I know everything yet, although I have been falsely accused of having pretended to, which I declare to be false, but I believe I know a little about watch work.

There are young men of the present time that are not so old as some of my grandchildren, who pretend they know more than I do, and even tell me so, but as we are in a "progressive age," the young men of the present day are not "so slow" as we were years ago. They are or they think that they are so much "smarter" than the "old fogies." One evil in the watch and jewelery trade in this country has been that so many innovators or outsiders have gone into that business, such as dry goods, hardware, millinery fancy, Yankee notions, toy and dry goods stores, etc., who are keeping and selling watches and jewelry, not knowing themselves in many instances whether they are buying genuine or bogus articles. These branches of commerce have got to be nearly as common as book, tree, sewing machines, insurance or advertising agents, so much of it being done by travellers or agents. If you ask one of your old customers why he does not call on you, his answer will most likely be, "Why I can buy cheaper at my door than by taking the trouble and incurring the expenses of going to see you." Now, who often has to pay the expenses of these travellers? Sometimes the manufacturer, if not the purchaser.

At the exhibition of Philadelphia, I find as well as many others do also, that the awards or medals were in most cases given, not for the superiority of the workmanship or usefulness of one article over another, but in many instances for fine *displays*, fine polish, or fine finish of many articles, so that nearly all the exhibitors received medals or awards. Now which is the "best." Others have got into controversies about that as well as the watch trade ; such as makers of sewing machines, pianofortes, etc. In watches nearly, if not all who exhibited, got awards for their display, so that they must have been all "best." Any one that has ever been to London, Paris or Geneva, must admit that there are fine *displays* of watches, and that they make fine watches there, the makers of which knew that the reputation of their goods was so well established, that it was useless to make a show or test of them, and that they could not be surpassed if equalled for beauty

accuracy or fine finish. It used to be and many thought also that it would be done at Philadelphia, that when two or more articles were put on exhibition or competition, if they were of the same kind, prizes or premiums were awarded to the "best only" if there was many of the kind deserving premiums. Three prizes were given, a gold and a silver medal and a diploma, besides honorable mention to those deserving it. Now the silver medals which I received from the Franklin Fair at Philadelphia, and the two from the American and Mechanics fairs in New York, and a diploma for patterns of watch cases (the maker got a silver medal), these prizes I received for the superiority of my work over the other competitors, and not for my fine display, for I had only two movements, not even gilt, four watches and three watch cases ; I say that I feel prouder of them than if I had received four awards from the International Exhibition of 1876, besides they were sent to my place of business free of any expense to me. Any one wishing to see them can do so by calling at my office. I have them yet. I should have obtained the gold medal, but I had not made the pinions or the wheels myself. I certainly should have put on exhibition in Philadelphia the repeater which I had made entirely myself, all except the wheels and pinions and the case ; I should also have shown the box full of pieces all made by hand work for repeaters, etc., in different stages or branches of manufacture. I believe I should also have obtained an award. It would have convinced the most sceptical who say that machine turning is better and truer than by hand work, but it is not so ; I admit that for large pieces, machinery is better and quicker. There is one thing very certain and a proof that "honesty is the best policy" and will last the longest, is that in the names of the English, Swiss and American watch manufacturers which I named in the last edition of "The Watch," there are some yet living and doing well, and will long hereafter have, as many before them have had, the respect and praise of the world as upright and conscientious men, while those who made money either in the watch or jewelry trade, or in any other calling by trickery, cheating or by taking advantage of the poverty of the working classes, are forgotten, and if spoken of it is with scorn and contempt. I could lengthen this subject so as to make a large book instead of a pamphlet, but as my occupation is not writing but watch making, and as I only entered into this controversy to try to overcome any false impression that had been spread about watch work in this country, and at the same time renew a few of my advices, not only to watch makers, but to the public also ; but I cannot finish without repeating some of my

advice to watch repairers, and what I said before about the foreign and American watches. "Those who do not understand their business thoroughly, but only work at random, especially on finely finished or good complicated watches, who have picked up a smattering of their trade and merely follow it for the purpose of money making, who will not receive instructions from more skilful, experienced and practical workmen, for fear of exposing their ignorance, to such I would say, leave the business and do not represent faults and defects to exist that have their origin only in your imagination, whereby you injure the reputation and credit of the honest portion of watch makers and repairers."

In all that I have said I wish it to be distinctly understood that I do not intend to criticise or disparage the American system of making watches. I have and do yet applaud them for their energy, genius, skill and integrity, in simplifying and making new kinds of labor-saving machinery, and for their enterprising spirit. I only wished to point out the evils that may follow the adoption of too much machinery in watch work, and also to show the working classes of Switzerland that they have a friend in this country who is bold enough to endeavor to protect their industry. I still maintain that the American watch is a good, substantial and sound watch, that have and will still replace the common English one in this country, but I cannot admit the word "better," neither that they are more accurate, more durable and better or finer finished than a good Swiss watch of the same price, or that they will drive them from this market. They may "stun" for a time their factories, but not "crush" them. Still I wish the good ones success, as it has done some good for the buyer in reducing the price of time-keepers, which in these days of railroad travelling is necessary to every man ; but be not too ambitious and attempt to become too powerful. Remember that many great men in olden times, for instance Napoleon I., in my time, by attempting too much and wishing to conquer the world, fell himself. I have written this not for the purpose of money-making—I am too far advanced in years to think about that now ; still if I did make a little by it, I believe it would be honestly earned by hard study and work. I hope it may be the means of apprising some of my old friends and customers that I am still in the land of the living, and still able to sell them watches, English, Swiss or American, and attend to the repairs of their old ones of any description, and I repeat that what I cannot now do myself, I will see that it is properly done. If I have said anything to hurt the feelings of any, I am sorry for it. It was not or is not my intention to injure any

one, but any one acquainted with me knows that I am naturally "blunt and plain speaking." For the short time that I may be spared on this to so many a "vale of sorrow, trouble and care," I will continue as far as lies in my power to defend the rights of all honest and upright working men against the oppression and injustice to which they are often subjected. Whether I am right or wrong I leave to others decision. One thing is very certain that a *worker by hands* very seldom gets rich. I will only copy two out of the great number of favorable notices and reviews of the Press which I received on the first and second editions of this work many years ago :

New York Scientific American, June 16, 1860.

"Our fame as a clock making nation is world-wide, for where can we travel in Africa, Australia, India or China, that a Yankee clock is not found reminding the inhabitants of the 'land of steady habits.'

"With regard to watches, we have also begun to do something creditable, still it is well known that the works of nearly all the watches in the United States are imported from abroad. The manufacture of cases is carried on extensively in a few places, but they are only lids to foreign mechanism, while a great number of watches are imported entire. A very useful little book on this subject has lately been produced by H. F. Piaget, of this city, a practical watch maker of over forty years practical experience. He commenced his efforts of fabricating watch work in Switzerland, and he also made watches in London for several years and has followed the same craft in America since 1832, so that he can speak authoritatively on the subject. The opinion of an experienced and skilled artisan as to the character of our American-made watches is of great value ; we are told by Mr. Piaget that 'the American watch recommends itself for simplicity of construction, and it will be continually improving if the manufacture remains in the hands of persons who will make it of good quality without regard to the price.' This is timely and appropriate advice ; it is an injunction to strive for excellence rather than cheapness in such articles. The advice is particularly good at this time, because very great efforts have of late years been made to produce cheap rather than good watches."

From the Lady Elgin, Elgin, Ill., October, 1872.

"We desire to acknowledge the receipt of a book on watch making, entitled 'The Watch,' sent to us by the author, H. F. Piaget, of New York. We have submitted it to one of the foremen of the National Elgin Watch Company, who has both skill and experience in the art of watch making, and he pronounces the work good and sound. It is well written in a plain, straightforward manner, and its tone of honest candor is very pleasing. One has but to read it to be certain that the author treats only of facts gathered from his own experience, and the opinions expressed and the advice offered are evidently the result of careful observation and honest conviction."

These are two specimens of nearly one hundred reviews and notices which I received from the newspaper press throughout the United States, together with many flattering letters from private individuals as well as the recommendations from some of the most respectable portion of the trade, for which I again return my sincere thanks. I feel more proud of them, than I should have been of an award from the Centennial Exhibition.

I will also reproduce a short essay compiled many years ago, which is applicable to these times.

THE GREATEST FORTUNE AN UNSPOTTED CHARACTER.

Money is a good thing, especially in these hard times, but there is something a thousand fold more valuable—it is a *good character* ; the consicousness and satisfaction of a pure and honorable life. This should be a man's first aim to preserve at any cost. In times of commercial distress, while some are proved and found wanting, others come forth as tried by fire. Here and there one comes out of the furnace far more of a man than before. Amid the wreck of his fortune he stands erect, a noble specimen of true manhood.

We have occasionally witnessed an example of moral intrepidity and true courage in such a crisis that deserved all honor. Let it be the aim of every business man above all things to keep his purity and name sustained. This is the greatest fortune ; it is the finest jewel ; it is a capital which can never be taken from him. This is the richest inheritance which he can leave to his children. The man or woman, however hard they may have found it to struggle through life, and who having raised a prosperous family with habits for industry, the dread of doing evil and in the fear of God, can, in their declining days say, "I never intentionally deceived or wronged any one," posesses the greatest riches in the world, a good conscience, and are sure of being rewarded, if not at present but hereafter, for remember that the "all-seeing eye" is never closed, stopped, broken or worn out, but is looking down on all our actions, while our watches (those that are in good order) are kept wound up and going, but they cannot do it eternally, while a good character and name will last to the end of time."

I will now conclude with what I said in my first edition of 1860. A life like mine devoted to measuring the flight of *time* admonishes me that there is a *time* for all things, a *time* to begin and a *time* to end. I therefore conclude in the earnest hope that those who have attentively read my remarks will not feel offended or consider it time misspent, but feel that they have thereby added to their stock of useful knowledge a little information ; if I have accomplished this I shall not repent that I have again for the third *time* exchanged the work bench for the writing desk, and I shall return to the work bench to continue, as I have for so many years heretofore been the public's most faithful servant, to make, examine, or repair its watches; and when *run down*, hope to be *wound up by my Maker* and set eternally going in the life to come. And now my task being ended I again cast it on the waters, saying :

"Go thy ways,
And if, as I believe, the vein be still good,
The world will *again* find thee after many days."

THE AUTHOR.

I would respectfully inform the public that this work is copyrighted, and that if any journals, newspapers, etc., wish to make extracts, that they will please to give credit where copied from.

SWITZERLAND TO AMERICA GREETING.

The Centennial Judges having awarded to the Messrs. BOREL & COURVOISIER two prizes at the late Centennial Exhibition for their production, one for extreme accuracy in adjustment, and regularity in performance, and the other for display. They are now offering their Watches at a great reduction from former prices, having introduced improved machinery, whereby the production is increased, and the cost of manufacture greatly reduced, and the quality and durability improved, insuring a first-class NICKEL MOVEMENT WATCH within the reach of all. These Watches so favorably known for the past 18 years, are made of the best material, and have all the modern improvements in watch making, having CHRONOMETER BALANCES, BREGUET HAIR SPRINGS, TEMPERED, HARDENED AND ISOCHRONISED FOR R. R. TRAVEL, FINE RUBY JEWELED, and are warranted to perform with the regularity and accuracy of a Chronometer. These Watches are for sale by all our local agents through the country, and parties desiring a good and durable time-keeper, are requested to examine them before purchasing those of other manufacturers or home productions.

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